started. It appears, on calculation, that potential temperature (i. e., temperature assumed by a gas when its pressure is altered adiabatically to some standard pressure, will be transmitted upward through the atmosphere by means of eddies in the same way that temperature is transmitted in a solid of conductivity K, provided that $K\rho\sigma=\frac{1}{2}\omega d$; where ρ is the density and σ, the specific heat of air, ω represents the mean vertical velocity of the air in those places where it is moving upward, and d the average vertical distance traversed by the eddies; K is termed the "eddy conductivity" of the air. Now, if the temperature distribution in the air at any time is known and the subsequent changes at the base of the atmosphere, the temperature distribution at any later time can be calculated, assuming a value for K. The theory was put to the test by means of some kite ascents made from the ice scout ship *Scotia* in the North Atlantic. From these the upper-air temperature distribution was determined; and by tracing back the course of the air over the sea the different temperatures to which the surface layer had been exposed for the preceding few days were approximately obtained. The upper-air temperature distribution was found to agree well with that which would be expected from the theory, and calculation of K for the individual ascents gave values showing some proportionality to the mean wind velocity. As the eddy motion would naturally be more pronounced on days of strong wind, this result is satisfactory.

In the same manner that eddies effect a transference of heat between different parts of the atmosphere, so also will there be a transference of momentum from one air current to another. The velocity of the layer of air in immediate contact with the earth is reduced by the frictional drag, and assuming this reduction of velocity to be communicated to the upper layers by "eddy viscosity," certain relations between the surface and upper wind are worked out. The resulting height-velocity and height-direction curves obtained agree remarkably well with the mean results of observations made with pilot balloons on Salisbury Plain. One noteworthy feature in which the theoretical result agrees with the experimental is that the gradient wind velocity is attained by the actual wind at a less height than that at which the gradient direction is reached. The present theory agrees with the observed facts in several particulars where the previously existing theory of Guldberg and Mohn fails.—*J. S. Dines.*

NATURE OF THE ZODIACAL LIGHT.[1]

By F. SCHMID.

[*Reprinted from* Science Abstracts, Sec. A, June 25, 1915, §678.]

The suggestion is made that the zodiacal light may be due to sunlight reflected from the lenticular segment of the earth's atmosphere produced by the equatorial protuberance due to rotation. The difficulty that the phenomenon follows very closely the axis of the ecliptic and not the Equator is explained by suggesting that the atmospheric protuberance is displaced by the gravitational action of the sun and planetary systems, all of which are nearly in the ecliptic plane. The idea is elaborated by several excellent diagrams showing the coincidences with the observed phenomena.—*C. P. Butler.*

[1] See Archives des sciences, 1915, 39:149-166, 237-246.